

SOUTHWEST RESEARCH INSTITUTE®
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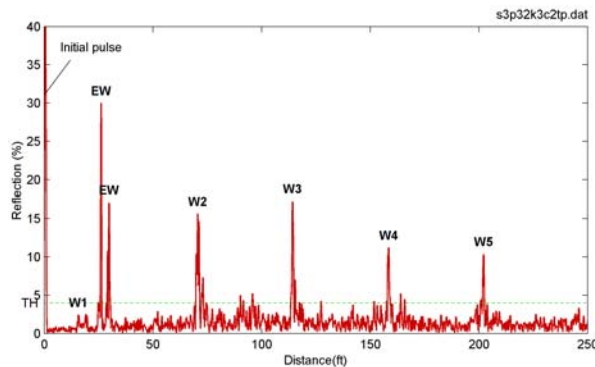
OTHER TRANSACTION AGREEMENT DTRS56-03-T-0013
SwRI® PROJECT 14.10062

HIGH-POWER LONG-RANGE GUIDED-WAVE INSPECTION OF PIPELINES

Approximately one-half of the nation's supply of crude oil and petroleum products and virtually all of its natural gas supplies are transported through a pipeline network over 2 million miles long. Since a majority of these pipelines are operated at high pressure, and some carry hazardous liquids, pipeline failure can cause severe damage to human health, property, and the environment. The long-range guided-wave technology can inspect long sections of pipeline (typically more than 100 feet from the sensor in either direction in above-ground pipe for detection of 2- to 3-percent internal and external corrosion defects) and is useful for direct assessment of pipeline conditions for enhanced safety.

This project is aimed at producing a high-amplitude guided wave so that a significantly longer length of piping than is presently achievable could be inspected. The target goal of the project is a twenty-fold increase in the guided-wave signal amplitude using the magnetostrictive sensor (MsS) technology developed at Southwest Research Institute (SwRI). Industrial partners in this project include the Pipeline Research Council International, Southern California Gas Company, Gulf South Pipeline Company, and SwRI.

The target goal was achieved through the combined use of new MsS material and sensor optimization. In aboveground pipelines, inspection of more than 250 feet of line containing a 90-degree elbow was achievable in one direction, as shown below. Further field evaluations of the high-power guided waves are underway, including cased pipelines at road crossing and buried gas transmission lines.



32-kHz T-mode data obtained from one leg of vertical, U-shaped expansion loop of 14-inch-OD gas transmission pipeline

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